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THE FUR-SEALS OF THE PRIBILOF ISLANDS

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IT has often been said that more legislation has been devoted to the northern fur-seal than to any other animal. So far as the United States is concerned, this statement is not surprising, for the revenue that has been derived from these animals since 1867 when our government acquired possession of their principal breeding place, the Pribilof Islands, has been more than ten millions of dollars. This large sum does not represent all pure gain, but the profits included in it must have gone a long way toward meeting the seven million dollars and more that the United States paid Russia for the whole of Alaska including the Pribilofs. And, if the Alaskan account is not already settled by the past income from the seals, it can be so discharged with a very little care. Of all the treasures in Alaska, the seals are probably among the most valuable. Unlike mineral wealth, they need never run out, for, in consequence of their powers of reproduction, they can yield under reasonable control a large and continuous revenue for an indefinite future. It is therefore easy to understand the unusual occasion for legislative activity in behalf of these animals and indeed any government would be most negligent of its interests did it not exert itself to the utmost to maintain and improve so valuable a source of income.

The popular idea of seals comes mostly from the hair-seals which are common in the harbors and along the shores of many countries. These animals are noted for their agility in the water, but on land they are clumsy and awkward. The fur-seals are not closely allied to the hair-seals, but find their nearest relatives in the sea-lions, whose skill on land is often attested by their remarkable acrobatic performances in zoological gardens and even on the stage. The fur-seal, though apparently not so skilful as the sea-lion, is thoroughly at home on land and walks and runs like a short-legged bear. Hence it has often been called the sea-bear. It is also a most skilful and adroit swimmer.

The fur-seals of the North Pacific are represented at present by three herds (Fig. 1). A small one of perhaps ten to twelve thousand

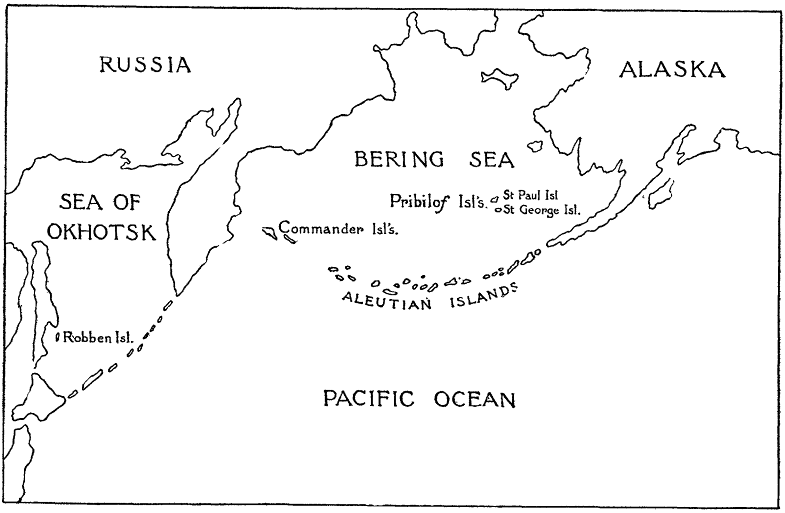


FIG. 1. OUTLINE MAP OF THE NORTH PACIFIC AND BERING SEA, showing the locations of the breeding grounds of the three fur-seal herds: Robben Island, the Commander Islands, and the Pribilof Islands.

individuals breeds on Robben Island in the Sea of Okhotsk and is supposed to have a migration route in the Sea of Japan. This herd is now under Japanese management. A second and larger herd breeds on the Commander Islands west of the Aleutian chain. These seals are said to migrate along the eastern coast of Japan and are under the control of Russia. By far the largest herd is that which breeds on the Pribilof Islands. Its winter migration route lies southward through the passes of the Aleutian Islands into the Northern Pacific with a return route along the west coast of North America. This herd is under the management of the United States. All three herds are supposed to be quite distinct and not to mingle in their migrations. Each probably represents a distinct species.

The discovery of these seal herds is due to the early Russian naviga-

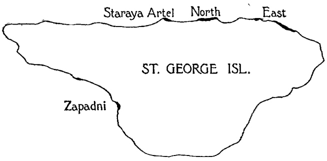


FIG. 2. OUTLINE MAP OF ST. GEORGE ISLAND, showing the location of its four fur-seal rookeries.

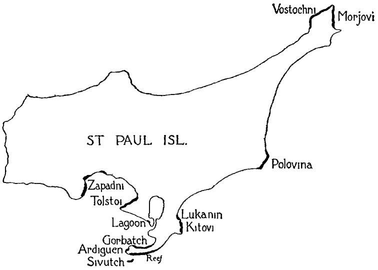


FIG. 3. OUTLINE MAP OF ST. PAUL ISLAND, showing the locations of its twelve fur-seal rookeries.

tors. Late in the year 1741 Bering, in returning from his second voyage to the North Pacific, with a crew sick and much reduced, reached the Commander Islands rather by good fortune than by good seamanship. On the island subsequently named for him the expedition was forced to winter. Here scurvy still further reduced the crew, and among those who died was Bering himself. In the following spring, Steller, the naturalist of the expedition, reorganized the party for its return, but, before its departure, the arrival of the fur-seals took place and thus was disclosed to Steller the breeding haunt of what has ever since been the chief body of the Russian herd. Later navigators, in their explorations of the Aleutian chain, tried to follow the fur-seals that were seen in migration in the passes of these islands and thus to discover their breeding places. But none of these efforts were successful till 1786 when Pribilof made his way through the mists and fogs of Bering Sea to Saint George Island, where he came upon the hosts of fur-seals that breed on its shores. Although only forty miles distant and under a clear sky easily visible from Saint George, the larger and richer island of Saint Paul was not discovered till a year later, a fair commentary on the prevailing weather of this region. Thus the two great seal islands of Bering Sea were thrown open a little over a century and a quarter ago to the Russian traders. With our purchase of Alaska from Russia in 1867 these islands became a part of the United States.

Both islands are of volcanic origin, though at present no active volcanoes or even hot springs are found upon them. Their general surface is composed of lava rock, boulders and volcanic sands. There are no trees upon them, but in the short summer they are covered with a coarse, luxuriant tundra growth. Neither island has a good harbor and the weather is often so tempestuous that they afford practically no lee to vessels. Saint Paul is a succession of low rolling hills. Saint George is more precipitous, some of the cliffs on the shore rising to a height of a thousand feet or more. Saint Paul is a little over thirteen miles in total length and Saint George not above twelve. Yet these two islands whose total area is not so much as eighty square miles have yielded the unusual revenue already noted. Who can tell what the rest of Alaska with an area of more than half a million square miles may yield?

When first discovered the islands of Saint George and Saint Paul were without human inhabitants. The Russians, however, soon brought to their shores as a means of carrying on the seal industry a number of Aleut Indians and these intermarrying with the Russians gave rise to the present so-called native population. These natives are gathered together in a village on each island. In 1914 the village of Saint George contained 116 natives distributed in twenty-four households and

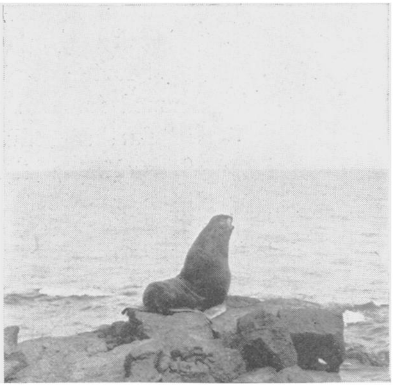


FIG. 4. MATURE BULL IN PRIME CONDITION AWAITING THE ARRIVAL OF THE COWS. Kitovi Rookery, June 22, 1914.

the village of Saint Paul 192 natives in fifty households. Besides the natives, each village contains a few whites: a government agent, doctor, school-teacher, store-keeper, radio-operator and the like. But interesting and commercially important as the natives are and fascinating as are the herds of reindeer, foxes, and sea-lions, and the great bird rookeries of the Pribilofs, none of these can compare with the long stretches of beach occupied by thousands upon thousands of fur-seals. Indeed it is highly improbable that there exists anywhere else on the surface of the globe such a huge exhibition of mammalian life as on the shores of these islands.

A strange terminology has grown up in the description of the fur-seals. Full-grown male fur-seals are called bulls and the mature females cows. Their offspring are known as pups. The young males before sexual maturity are termed bachelors. A bull with his assem-

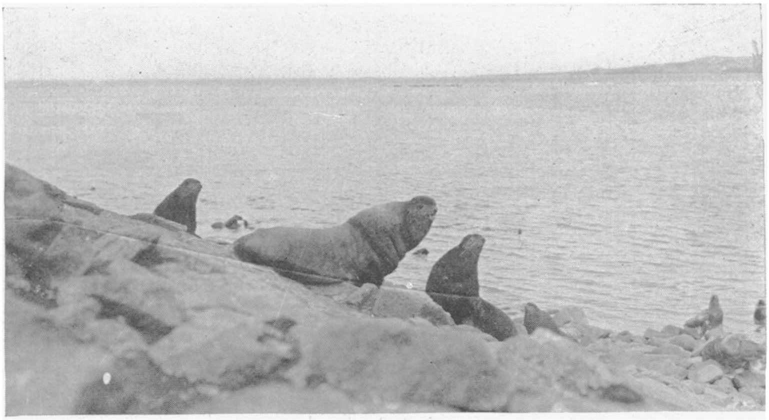


FIG. 5. WAITING BULLS ON SIVUTCH ROOKERY, June 29, 1914.

blage of cows is called a harem and a succession of harems on a beach constitutes a rookery. Strange and incongruous as this usage may seem, the individual terms when taken in relation to the particular aspect of the herd to which they refer are found to be descriptively most appropriate, and the observer in spite of his sense of the proprieties of language is brought quickly to adopt them.

The seals do not locate indiscriminately on the beaches of the Pribilofs, but repair year after year with great regularity to particular stretches, the so-called rookeries. Judging from the conditions of the shores and the declarations of the natives, these rookeries have been remarkably constant for many years past. They still retain for the most part the Russian names that were given them in the early days of their discovery. At Saint George four such rookeries can be distinguished (Fig. 2). On the shore of the island near the village are East Rookery, more or less subdivided, North Rookery, and Staraya Artel, probably indicating, as the Russian name implies, the location of one of the original settlements. Across the island from the village is Zapadni or the West Rookery. On Saint Paul there are no fewer than a dozen active rookeries (Fig. 3). At Northeast Point are Vostochni or East Rookery, and Morjovi or Walrus Rookery. Polovina or Halfway Rookery is between Northeast Point and the village of Saint Paul. Not far to the northeast from the village itself are Lukanin Rookery and Kitovi Rookery. To the south and southwest of these are Reef Rookery, Sivutch Rookery on Sea-lion Rock, and Ardiguen and Gorbatch rookeries. North from the village is the small Lagoon Rookery.

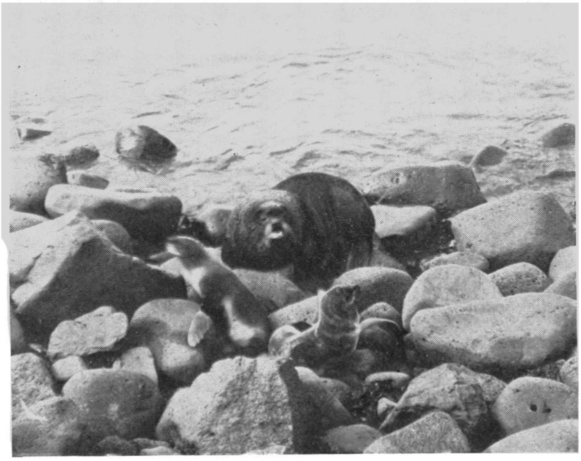


FIG. 6. TWO COWS WITH BULL. Probably Gorbatch Rookery, late in June, 1914.

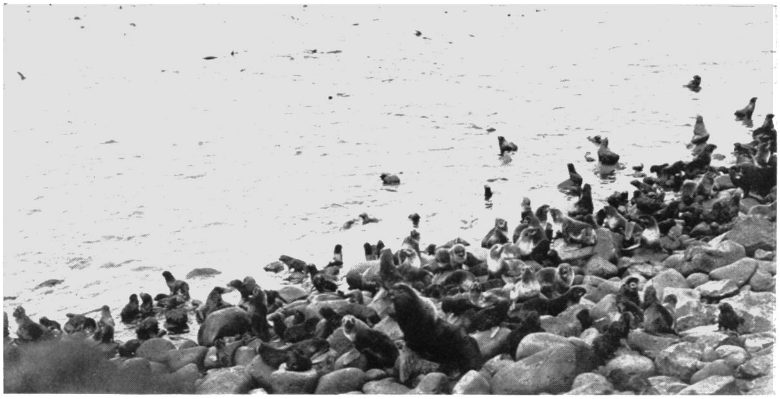


FIG. 7. A HAREM ON GORBATCH ROOKERY; the bull with many cows and new-born pups. July, 1914.

And on either side of English Bay are Tolstoi Rookery and the more or less divided Zapadni or West Rookery. It is on these situations, and not on the beaches in general, that the fur-seals congregate in enormous numbers for their breeding season. In consequence the rocks in these regions have become worn and smoothed so that even in the absence of seals a rookery site can be distinguished from that of an ordinary beach.

During the late winter all the fur-seals are at sea, but as summer approaches they migrate toward the Pribilofs, and in favorable seasons they begin to appear on the island rookeries as early as April. The first to come are the adult males or bulls (Fig. 4). The few that may appear in April take their places on the beaches and are quickly followed in May and the early part of June by the remainder of their kind. By the middle of June the great majority of the full-grown bulls have established themselves on the beaches to await the coming of the cows (Fig. 5). At this stage the bulls are in marvelous form. Their pelts are heavy and firm and their bodies in prime condition. In weight they are not far from 400 pounds. They seem to be possessed of inexhaustible energy. They will charge any intruder, man or beast, and drive him from their preserves. They move with a curious loping gait which may be about as fast as a man can run over a rough beach. After fifty to a hundred feet of such travel they usually desist, apparently from lack of wind. Their object at this season seems to be to defend their chosen territory from invasion, and this they will do to the bitter end. It is practically impossible for a human being to dislodge them and if another bull opposes them, they will slash him over the head, breast and fore flippers with their protruding canines till the blood and fur fly in all directions. Such contests are carried out with an enormous amount of snorting, hissing, and enraged breathing that make them most exciting to the onlookers. The object of this whole performance is the maintenance around the bull of a certain area of clear beach in which the cows will eventually assemble. Deaths are apparently not common in these early struggles, though the strain of the situation is often to be noted in the scarred and bloody condition of many of the combatants. The term "beachmaster" is an appropriate designation for those of the bulls that maintain their places against all comers.

As the bulls are establishing themselves, the cows begin to arrive (Fig. 6). They are relatively small, timid creatures, weighing on the average about seventy pounds. They begin to appear near the tenth of June and continue coming till well into July or even August. Those that arrive early make their way in among the bulls without exciting great attention. They wander about somewhat aimlessly but eventually associate themselves with a given bull, after which they are treated by him as part of his growing harem and more or less jealously guarded. Thus each harem as the season progresses gradually increases in the number of its cows.

The maximum size of a harem can not be stated with accuracy, for as the season advances the cows are in and out of the water continually (Fig. 7). In 1914 the number of cows associated with one bull varied by actual count from 1 to 106. The average harem in that year, obtained by dividing the total number of breeding cows by the number of harem bulls, was approximately 60. It is probable that this number is somewhat too high for the best condition of the herd. There is,

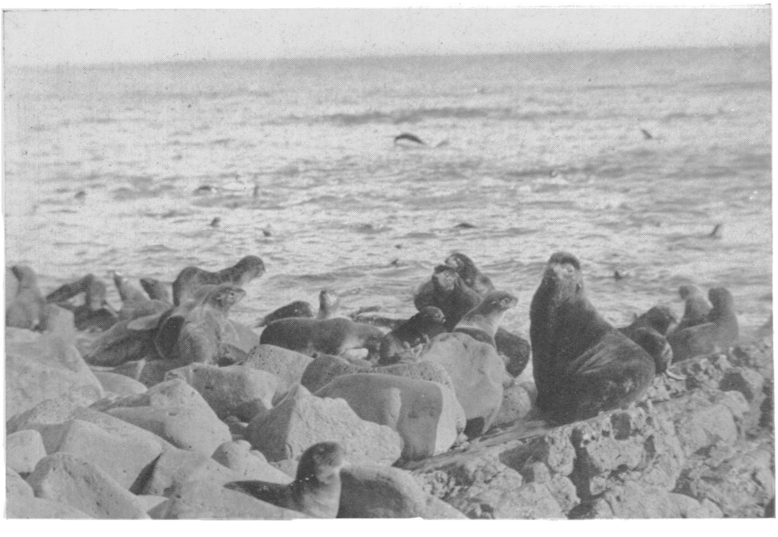


FIG. 8. DISORGANIZING HAREMS TOWARD THE CLOSE OF THE SEASON. Gorbatch Rookery, August 6, 1914.

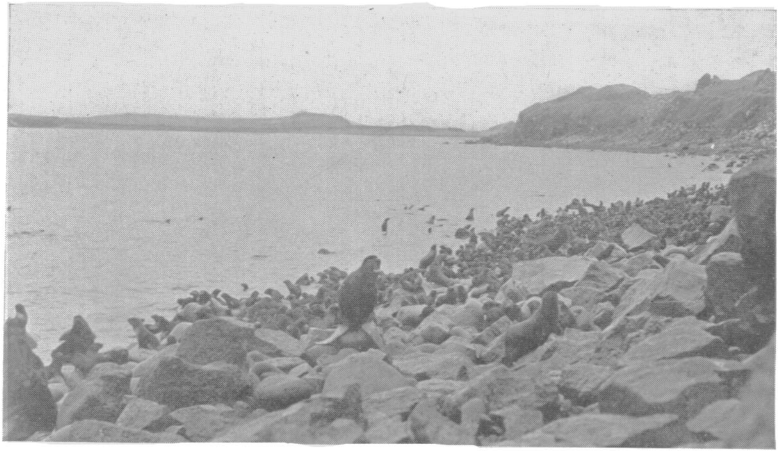


FIG. 9. ONE OF THE LAST BULLS TO LEAVE GORBATCH ROOKERY; the beach shows a preponderance of pups. Gorbatch Rookery, August 6, 1914.

however, no reason to believe that an average harem of 40 is in any sense an excessive number. What the average harem was in the original condition of the species and before man's intervention, can not be stated with certainty. It is believed to have been not over 40 and it may not have been less than 30.

The cows that arrive from the open sea are gravid females. Within a day or so after they have come ashore and joined a harem, they give birth to a single pup, and probably within a week after the birth of their young they are in heat and impregnated by the bull. The usual period during which the young are carried must, therefore, be a year less about a week. There is apparently no ground whatever for the

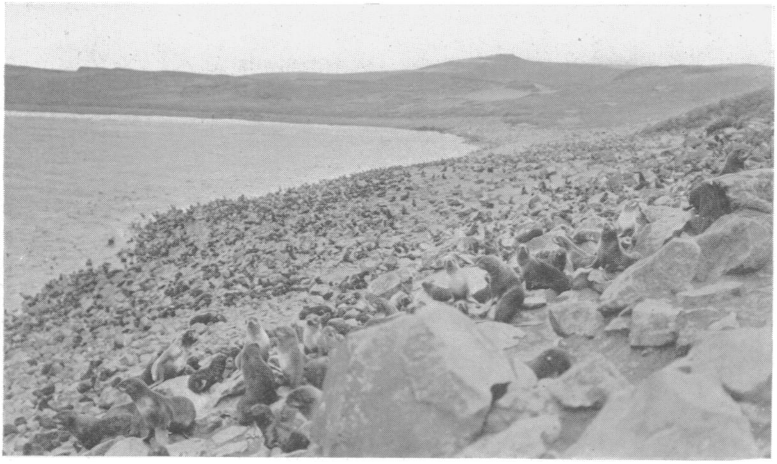


FIG. 10. TOWARD THE CLOSE OF THE SEASON; only cows and pups on the beach. Tolstoi Rookery, end of August, 1914.

supposition that the fur-seal breeds biennially and that its period of gestation is approximately two years.

After the cow has been impregnated, the bull is less solicitous about her and she leaves the harem from time to time for the open sea and feeding. During her absence, which at times may possibly cover a period of a couple of days, her pup fasts, but on her return he gorges himself with her milk.

As the season progresses and the pups are born and the cows impregnated, the vigilance of the bulls declines and in the latter part of July and especially in August (Fig. 8) the harems begin to disintegrate and the rookeries become one vast confusion of bulls, cows, and pups (Figs. 9, 10, 11). The bulls, as a result of their incessant activities, are in a state of extreme emaciation. Many of them have been on the beaches from May and during the period between the time of their arrival and the end of July or early part of August, they touch no food. This fast of well over two months coupled with their incessant activity drains them of all their stored energy. Their fat disappears and they are reduced almost to skin and bones (Fig. 12). In this state they may be driven off a rookery without resistance and they soon return to the sea to begin the winter migration. During this period they feed and fatten in preparation for the coming season. Thus early in August or even in July the bulls, who were the first to announce in the spring the coming of the herd, are also the first to take departure and begin the winter movement. They are followed gradually by the rest of the colony (Figs. 13, 14) and by November the rookeries are almost deserted, a few seals occasionally lingering on till well into winter.

From time to time during sealing operations many seal pups have been branded in such fasion as to allow them to be followed year by year as they grew up (Fig. 15). In this way a rough idea of the age of the fur-seal has been arrived at. It seems highly probable that the bulls and cows have approximately the same length of life, namely, from twelve to fourteen years. The bulls begin breeding at about the sixth or seventh year, though some may begin a year or so earlier, and are thus active for about half their lives as breeding individuals in the herd. As young animals they are known as bachelors up to about their fourth year after which they are commonly spoken of as half-bulls till about their seventh year, when they assume the condition of the mature bull. The cows first pair with the bulls at two years of age and bring their first pup to the islands at the close of their third year. If, as is supposed, they live to be twelve to fourteen years old and produce one pup a year, they must add to the herd in the course of a lifetime ten to a dozen new individuals.

About the habits of the cows little more need be said than has already been given in the general account of the formation and disin-

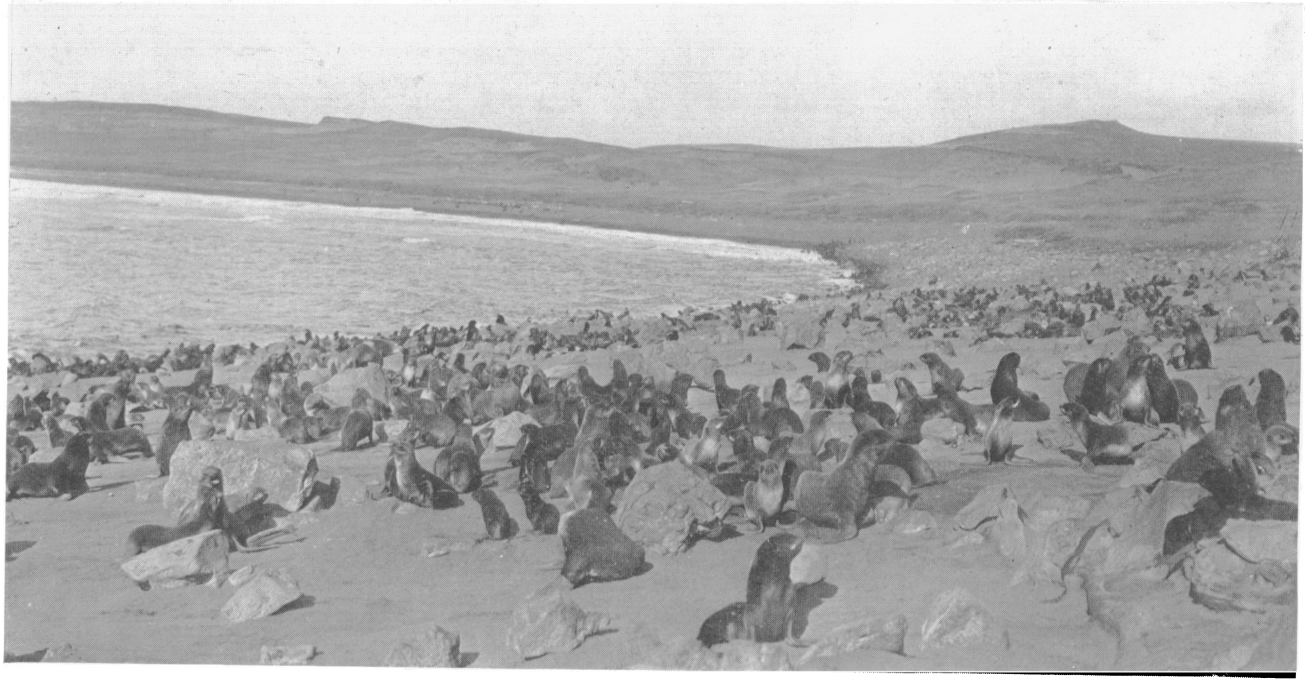


FIG. 11. TOWARD THE CLOSE OF THE SEASON; bachelors mingling with cows and pups. Tolstoi Rookery, August 23, 1914.

tegration of the harems. As already remarked, the cow is a relatively small animal, weighing not more than a fifth or sixth as much as a bull (Figs. 16, 17). They are on the whole timid and can be driven off the beach at almost any time. In the fighting of the bulls they often intervene in a strange way by clinging to the throat of the bull at the onset, after which very little real disturbance is likely to occur. If, however, the contest is really on and a cow comes in the way of the bull, she is likely to be seized by him and thrown bodily some distance back into the harem as a kindly reminder that the field of battle is not the place for females.

After the birth of her pup and her reimpregnation, the cow is free to make excursions from the harem into the open sea for feeding and she may travel in quest of food to a distance of fifty or a hundred miles from the island. On her return she searches long among the pups and eventually accepts one to whom she then gives milk (Fig. 18). With thousands of pups on the beach, it seems incredible that a cow after an absence of a day or more should find her own offspring, but, judging from her actions, she seems to be able to accomplish this feat. With the growth of the pup, she becomes less and less attached to the harem and, as these disintegrate in the latter part of July and early in August, she becomes a general inhabitant of the beach. Here she remains till November, when she takes to the sea for the winter migration.

The pups, one for each cow, are born shortly after the arrival of the cows, that is, between the middle of June and the latter part of July, thought newborn pups have been seen occasionally as late as August. At birth they weigh about eleven pounds. They come into the world commonly attached to the placenta, from which they are sooner or later freed by the breaking of the umbilical cord (Fig. 19). The vast number of placentas thus left upon the beach, together with the seal excrement, chiefly from the pups, gradually decompose in the cold northern air and give to the rookeries a penetrating odor, not to say stench, that can be recognized a mile or more away when the wind is in the right direction. This odor can be described as a strong stable smell with a slight aromatic turn to it. It is probably common to most seals and was certainly familiar to the ancients, for we are told in the fourth book of the Odyssey that when Odysseus and his men hid among the seals to surprise Proteus, each held beneath his nostrils some ambrosia with which to overcome the stench from the surrounding animals.

At the height of the season the rookeries are not only permeated by characteristic odors but are the scenes of the utmost confusion. The bulls hissing, snorting, and bellowing, the cows calling in a sheep-like bleat to their pups, and the pups responding in a higher pitch all contribute to a bedlam of noise which deafens the onlooker and has to be experienced to be appreciated. Into this malodorous tumult and confusion the fur-seal pup is born, and yet from the beginning he seems to be quite at home and he certainly thrives under conditions of filth where most animals would be expected to perish outright. His habits are extremely playful (Fig. 20). He is continually rolling about and tugging and pulling at his companions. If a person stoops down in a group or pod of pups, coat tails and trouser legs are likely to be seized and tussled by these little creatures in a way that is wholly pup-like, and the appropriateness of the name becomes at once evident. Till the first week in August the pup remains strictly on shore, after which he begins to take to the water, first paddling and then swimming. Thus he starts his preparation for the winter migration when in November as a plump little seal with a weight varying from twenty-five to fifty pounds he deserts his birthplace on his first migration southward.

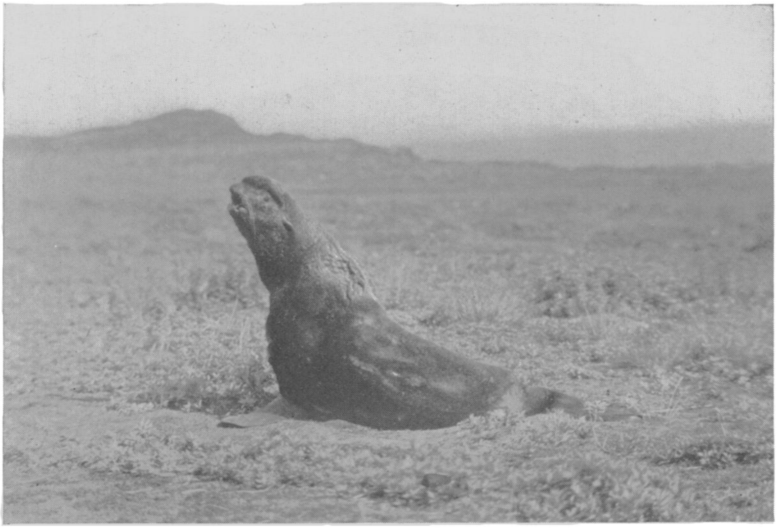


FIG. 12. SPENT BULL AT THE CLOSE OF THE BREEDING SEASON. Gorbatch Rookery.

The bulls, cows and pups occupy the real breeding areas of the rookeries, but besides these spaces there is also in every rookery of considerable size an extended area occupied by the young males or bachelors. These areas are known as the bachelors' hauling grounds and are usually to one side of the breeding grounds proper and have free and independent connections with the sea (Fig. 21). Here during the breeding season the young and immature males or bachelors congregate and live a life more or less independent of the rest of the herd. The bachelors begin to arrive on the islands with the bulls, the older ones coming first and the younger later, and they remain till the end of the season, being usually the last ones to depart in December or even later in the winter. They are quite what their name implies, being an unattached, rollicking and disturbing element in the herd. They are incessantly in and out of the water and are known to migrate between the islands during the breeding season (Figs. 22, 23).

With the bachelors are the half-bulls, six or seven years old, and as the harems disintegrate toward the end of the breeding season, these young bulls make their way in among the breeding members of the herd and often establish temporarily a small harem of two or three or more cows which have escaped from other harems or have arrived very late for breeding activities. In this way recruits from the bachelors' hauling grounds are introduced into the herd proper and thus year by year the worn-out bulls are replaced by new and younger stock.

Some uncertainty has prevailed as to the return of yearling seals to the islands, but it now seems to be quite clear that this really occurs. This very young stock, however, does not come to shore until after the actual breeding season is over. It is possible that a few may reach the beaches in the latter part of July, but the majority certainly do not come till after the middle of August. When they arrive, they do not haul out with the bachelors, but come to shore where the harems have disintegrated and associate themselves chiefly with the pups, from which they do not differ greatly in size. The pups on leaving the islands in November have an average weight between 37 and 38 pounds. When they return in the following August as yearlings, their weights range according to actual records between 33 and 41 pounds. Apparently during their nine months at sea they have not gained much in weight, if in fact they have not lost, but they have exchanged fat for muscle and thus have laid the foundations for that career of vigor and exertion to which all successful fur-seals must look forward.

The main facts in the life of the fur-seals, both male and female, are thus fairly well established. Many details are still to be added, but in general the life history of this species is well worked out. Born as a pup in one year the male yearling returns late in the season of the next year to play on the breeding grounds with the pups of that year. As a two-year-old on his second return to the islands he enters the ranks of the bachelors, where he remains till his sixth or seventh year, when as a half-bull he begins to take part in the breeding of the herd. He now transfers all his activities to the breeding grounds and as a full-grown bull or beachmaster works at the establishment of a harem season after season till his end comes at approximately his twelfth or fourteenth year.

The activities of the cows run a somewhat different course. The cow pup after her first migration probably returns to the islands as a yearling late in the second season to play among the pups as the yearling males do. On her second return as a two-year-old she arrives on the breeding grounds a little in advance of the disintegration of the

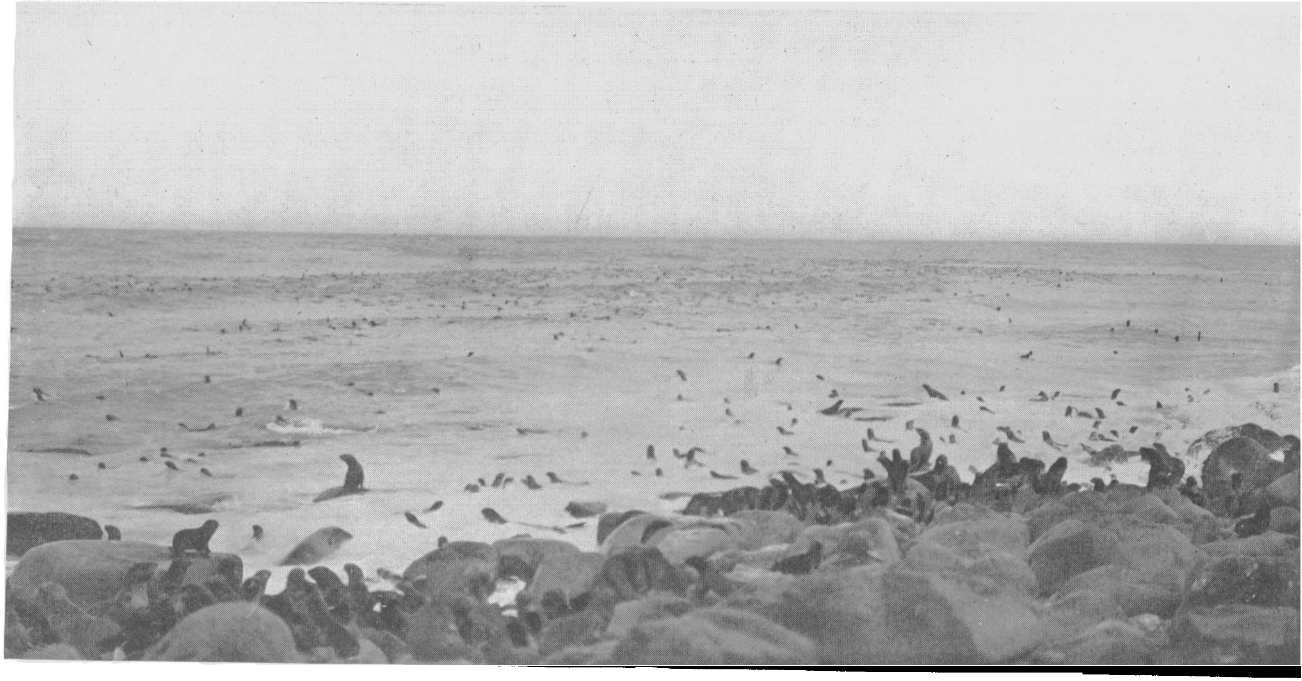


FIG. 13. COWS AND PUPS SWIMMING. Vostochni Rookery, August 17, 1914.

harems. She enters one of the harems formed late in the season by the younger bulls and becomes impregnated for the first time. In consequence of this her first pup is brought to the island at the end of her third year when she enters regularly into the breeding activities of the herd and adds a pup to the seal population for each subsequent year in her life. Thus the fur-seal herd maintains itself through the intensive and regular but relatively brief breeding season on the islands alternating with the annual winter migration of some six to nine months during which its members spend their whole time in the open ocean, for, though their migration route extends as far south in the Pacific as Southern California, they are never found close to shore.

The only way the early Russian sealers had of procuring the skins of the fur-seal was by capturing these animals in the open sea during their migrations. After their breeding haunts were discovered, land killing became the customary method and for this purpose in 1799 the Pribilof Islands passed into the control of the Russian-American Company. This company killed for their pelts large numbers of young seals, both male and female, till 1835, when the herd was so far reduced that restrictive measures were deemed necessary. Between 1786 and 1834 it is estimated that nearly two millions of seals were taken on the Pribilofs. From 1835 to 1867 the killing was more restricted and female seals were spared, a practice which has ever since been adhered to. As a result of these regulations the herd increased and, though over 600,000 skins were taken between 1835 and 1867, the herd when it passed into the hands of our government was variously estimated as containing from two to six millions of animals.

Under the management of the United States the privilege to kill seals on the Pribilofs was leased in 1870 to the Alaska Commercial Company for twenty years. On the expiration of the lease, a second one for another twenty years was made to the North American Commercial Company. This new lease expired in 1910, after which the government abandoned the leasing system and undertook the management of the herd itself. From the time when the Pribilofs passed into the possession of the United States till the end of the second American lease in 1910, over 2,500,000 skins were taken on the islands, and during this period, especially the latter half of it, the herd showed a steady decline in numbers. The cause of this decline was much discussed, but it is now generally agreed that it was not due to the regular killing on land, but to the practise of pelagic sealing which as an occupation had steadily grown.

In the early years of the sealing industry a certain number of seals were killed at sea during their migration or while on their feeding excursions from the islands. The sealers who obtained skins in this way were known as pelagic sealers. They were not very numerous till 1879, after which they increased very considerably in numbers till the practise was put down. At first the pelagic sealers were chiefly Canadians and Americans, but in later years many Japanese were engaged in this business. The pelagic sealers not only often captured more seals than were killed on the islands, but they killed in addition many seals that could not be retrieved and whose bodies were lost in the sea beyond recovery. Moreover from sixty to eighty per cent. of their catch were females whose pups must subsequently have died of starvation and whose importance for the further maintenance of the herd there and then ceased. It is, therefore, not surprising that with the development of pelagic sealing the herd should show a steady decline.

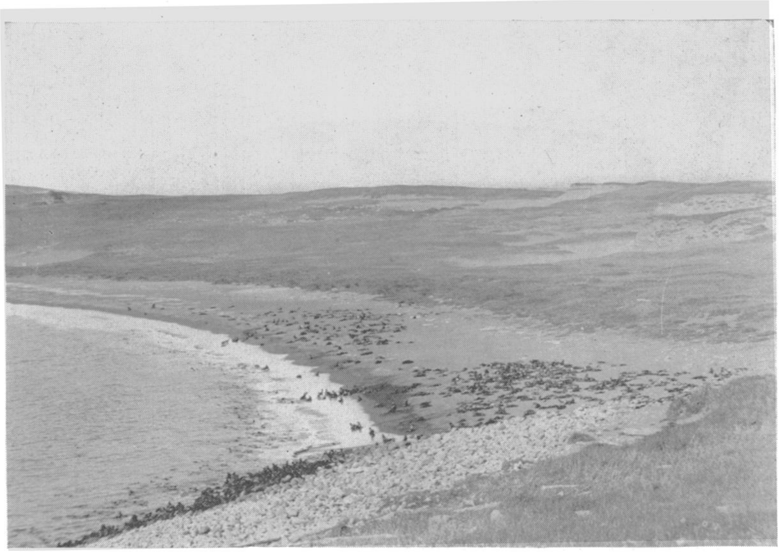


FIG. 14. YOUNG SEALS ON TOLSTOI BEACH, August 25, 1914.

Recognizing this fact, the United States took steps to protect its seal herd, with the result that it became involved in a controversy with Great Britain, some of whose citizens were active in pelagic sealing. It was finally decided by the two powers concerned to submit the whole matter to a tribunal of arbitration to meet in Paris in 1893. Meanwhile Great Britain agreed to prohibit British subjects from sealing in the eastern part of Bering Sea and the United States prohibited all killing of fur-seals whatever by its citizens except that 7,500 should be killed annually as food for the Pribilof natives. This agreement, commonly known as the "Modus vivendi," originally applied only to the year 1891, but it was renewed for 1892 and 1893.

As a result of the deliberations of the Paris tribunal, pelagic sealing was prohibited in a zone of sixty miles radius around the Pribilofs and was prohibited entirely between May 1 and July 1. These regulations, which were subject to reexamination at intervals of five years, went into effect in the summer of 1894. Nevertheless the catch from pelagic sealing continued to increase and the seal herd correspondingly continued to decrease. In 1896 the United States accepted the proposal of Great Britain to institute independent investigations of the entire question at the close of the five-year trial period. These investigations were made in 1896 and 1897 and the voluminous report of the American investigators was published in 1898. Meanwhile Congress toward the close of 1897 had enacted a law forbidding citizens of the United States from engaging in pelagic sealing at any time or place.

A new lease to the North American Commercial Company was not granted when in 1910 the old one expired, but the United States government assumed the full management of the herd. Toward the close of the following year a treaty was made effective between the United States, Great Britain, Russia and Japan, whereby sealing on the high seas was abolished for a period of fifteen years. By its provisions the United States and Russia, as owners or guardians of the seal herds, agreed to pay both to Great Britain and to Japan, for the relinquishment of their interest in pelagic sealing, fifteen per cent. each of the income from the United States and the Russian herds. In like manner Japan agreed to pay to the United States, to Great Britain and to Russia ten per cent. each of the value of the catch from her small but growing herd. Finally in 1912 in consequence of the reduced state of the Pribilof herd, the Congress of the United States passed the present law to the effect that no fur-seals should be killed on the Pribilofs for a period of five years except such as were needed as food for the natives, and that a breeding reserve of not less than five thousand three-year-old males be made annually during the life of the treaty suspending pelagic sealing. For some time past it had been the rule to make some form of count of the Pribilof fur-seals as an indication of the state of the herd. Since 1896 counts of the actual number of harems had been made annually. These counts had been carried out at what is called the height of the season, usually between the tenth and twentieth of July. Since 1912 the total number of pups born in the season has been counted and on the basis of the count of pups and of harems a fairly accurate estimate of the total strength of the herd has been made.

Proteus is said to have counted the seals of his Mediterranean haunts in fives and then to have lain down among them like a shepherd amid his flock. But when one looks over a modern fur-seal rookery with its myriads of active animals, some in the sea and others out and all in commotion and confusion, an estimate of the assemblage, not to

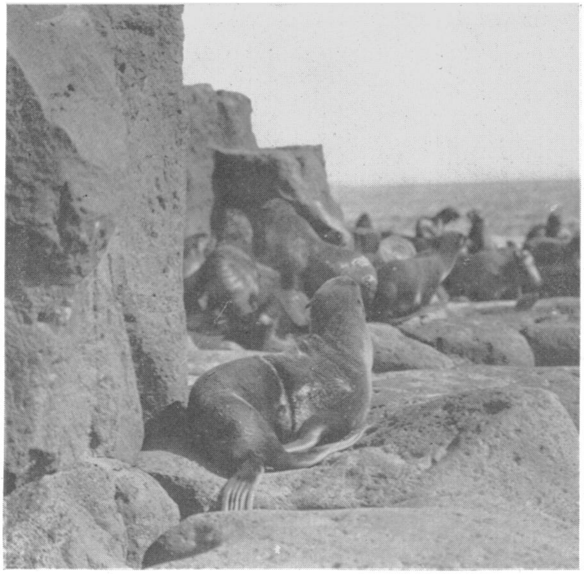


FIG. 15. BRANDED COW PROBABLY TWELVE YEARS OLD. Kitovi Rookery, August 23, 1914.

say a close enumeration, seems impossible. And yet with a little care and good management an enumeration of at least certain elements in the herd can be carried through with considerable accuracy.

At the height of the season, that is, about the middle of July, it is possible to walk along the upper edge of the beaches on which the rookeries are situated and count with fair certainty the bulls with their surrounding harems. At this stage of the breeding activities all the bulls have long since arrived and none have begun to depart,

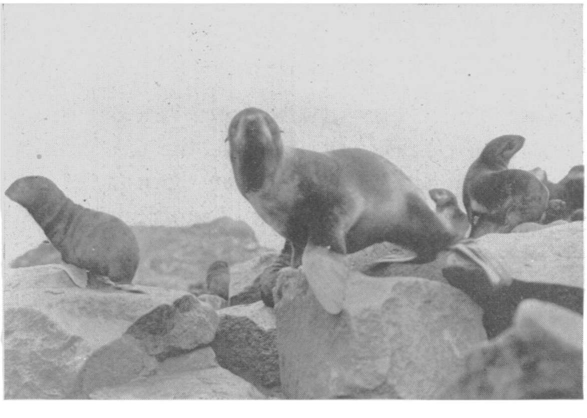


FIG. 16. COW AND PUP. Kitovi Rookery, August 25, 1914.

hence the conditions are favorable for a census. The bulls themselves, because of their size, are conspicuous creatures and even on very rocky beaches it is almost impossible to overlook them. In a few places, such as on Reef Rookery and especially on Vostochni Rookery under Hutchinson Hill, the harems instead of being strung along the beach are massed in considerable numbers and here the counting of the bulls was not easy, but on almost all other parts of the rookeries the counting of the bulls could be carried out with as much ease and accuracy as the counting of lamp posts or telegraph poles along a street. In this way a close count, accurate within very few per cent., can be made of the breeding bulls.

Toward the end of July the bulls begin to lose their ferocity and some of them even desert the rookeries for the open sea. At this time the majority of them can be driven at least temporarily into the water and with them all the cows. As a result the only members of the herd left on the beach are the pups. These do not naturally take to the water till after the first week in August and therefore at this season they may be counted, after temporarily clearing the beach of the rest of the herd (Fig. 24). In counting these active little creatures operations are begun at one end of a rookery. The pups are assembled in small groups or pods, and pod by pod is driven off in a thin line first on to the unoccupied beach and then, as the count proceeds over the rookery, on to that part freed of pups by the earlier count. The pups string out and run at a mild pace and may be counted as a miniature flock of sheep would be counted. After the live pups have been counted the beach is examined for dead ones and the number thus found is added to the number of living pups to give the total pup count.

This enumeration is also an accurate one, though not so accurate as that of the bulls. Pups may hide among the rocks and thus be omitted, but, aside from omissions of this kind, the count can be made a close one.

The cows, as already indicated, are coming and going between the rookeries and the sea almost continuously and therefore can not be counted with accuracy. The fact, however, that cows are known to produce only one pup each in a season allows a minimum estimate of the breeding cows to be made, for there must have been on the beaches in a given season at least as many cows as there were pups born. In this way the least number of breeding cows for a given year can be accurately inferred.

Rough counts can be made of the idle bulls, that is, of those bulls that have failed to establish harems and that spend their time on the outskirts of the breeding areas attempting to gather a few of the late

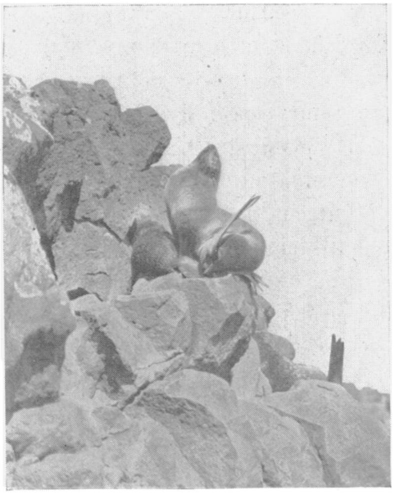


FIG. 17. SLEEPING COW AND PUP. Kitovi Rookery, August 23, 1914.

cows about them. These animals move about more or less and can not therefore be enumerated closely.

Finally the bachelors with their roving dispositions can not be dealt with except in the form of roughest estimates, upon which only slight weight can be placed. The fact that they are known to migrate from one island to the other in the course of the season shows that many may be at sea at a given time and that therefore any count of those on land can not be relied upon to represent their total number. This element of the herd is the only considerable one that can not be dealt with in any accurate way so far as enumeration is concerned.

In following the condition of the herd, the count of the new-born pups is of first importance, though the number of harems formed is also of great significance. The pups were first actually counted in the season of 1912, when somewhat fewer than 82,000 were noted. In 1913 over 92,000 were recorded. These two enumerations, which entailed an almost incredible amount of work, were made by Mr. George A. Clark, whose long services in connection with the Pribilof seal herds are well known. The enumeration of 1914 was made by an international party of investigators consisting of Mr. James M. Macoun and Mr. B. W. Harmon, representing Great Britain; Dr. T. Kitahara, representing Japan, and Mr. Wilfred H. Osgood, Mr. Edward A. Preble, and the author, representing the United States. The number of pup seals found by this party for 1914 was a little over 93,000, a slight increase only over the number of the preceding year. In the summers of 1915 and of 1916 the enumerations were made by one of the island officials, Mr. G. Dallas Hanna, with the result that increasing totals of new-born pups, namely, over 103,000 for 1915 and about 117,000 for 1916, have been reported. Not only has the total births of pups increased year by year, but the number of breeding

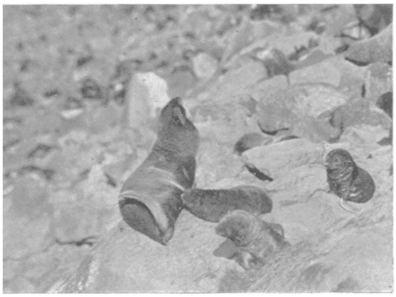


FIG. 18. COW NURSING PUP. Tolstoi Rookery, August 25, 1914.

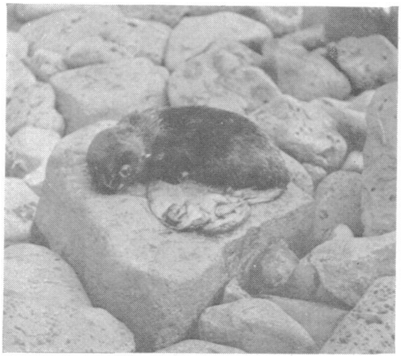


Fig. 19. Newborn Pup with Placenta Still Attached. Tolstoi Rookery, June 25, 1914.

bulls with their harems has also begun to move forward. In 1912 this number was 1,358, in 1913 it was 1,403, in 1914 1,559, in 1915 2,251, and in 1916 3,500. The average harem, which represents the average number of cows that must be served by a bull, has shown during this period a favorable decrease. In 1912 it was 60.4; in 1913 65.8; in 1914 59.3; in 1915 45.5, and in 1916 36.3. Thus in all respects the fur-seal herd under the new conditions shows all the signs of rapid recuperation. Its total size, for reasons already stated, can not be given with accuracy, but it is not unlikely that at present it contains not far from a third of a million of individuals. This number is far short of the two to six millions that it was supposed to contain when it was transferred from Russia to the United States. But whether these early estimates were correct or not can not be known and all that can be said at present is that, so far as well-established numbers are concerned, the tide has changed and in place of an unfavorable decrease a period of profitable increase and sound growth is well established.

The present law concerning the management of the Pribilof fur-seals prohibits the killing of what under ordinary circumstances would be the killable male stock, except in so far as it is needed as food for the natives. As a result of this law only a few thousand seals are killed annually and this small number will remain the number killed till the resumption of activities on a commercial scale after the season of 1917. Moreover the law prescribes that on the resumption of these activities an annual reserve of not fewer than five thousand three-year-old males for breeding purposes be made until 1926 inclusive.

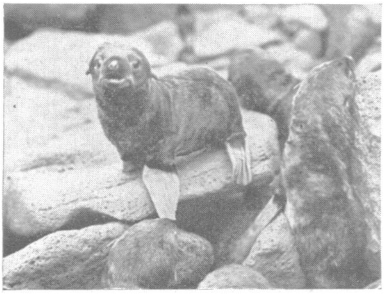


Fig. 20. Pups. Gorbatch Rookery, August 19, 1914.

The scheme of management thus outlined is neither for the advantage of the fur-seals nor for that of the government. The fur-seals, like other mammals, produce about equal numbers of males and females. Close counts show that there are one or two per cent. more males than

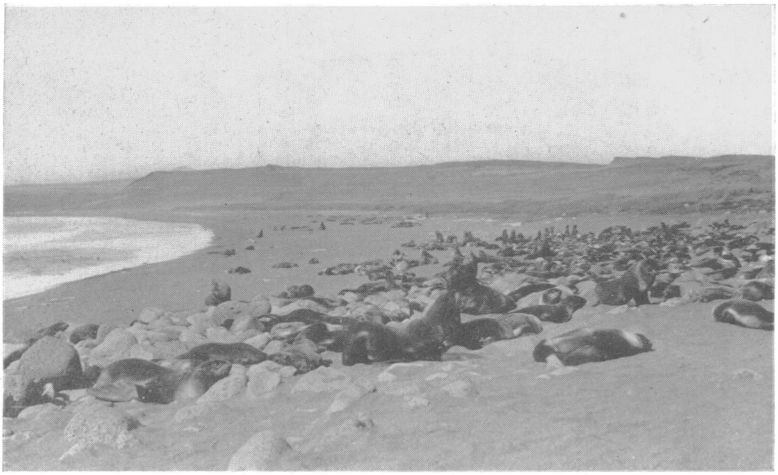


FIG. 21. BACHELORS "HAULED OUT" ON TOLSTOI BEACH, late in August, 1914.

females, but the difference is so slight that equality may be assumed. When, however, the animals arrive at the breeding age one male, as has already been shown, may have over a hundred females in his harem and though this number must be unduly large, it is generally believed that an average harem of thirty to forty cows is in no sense excessive. If the sexes are produced in approximately equal numbers and yet on the breeding ground under the best of circumstances one male serves thirty to forty females, it must follow that many males play no part in the breeding activities of the herd. These in fact are the so-called idle bulls and their number is in a way a measure of this maladjustment. They are sources of disturbance to the breeding individuals and they represent material that should have been killed when their pelts were in their most marketable state, that is, three years old. The most obvious course therefore to be pursued so far as the male of the herd is concerned is to retain at the most marketable age a certain proportion, not a fixed number as the present law prescribes, for breeding purposes and kill all others. If the breeding life of males and females was of the same length and these animals were associated in the proportion of one male to forty females, the reservation of one male in forty at the three-year-old stage would just supply the requisite number of breeding bulls. But the bulls breed only over some six or seven years, whereas the cows are sexually active for almost twice that period. Hence the male reserve should be at least two in forty, or five per cent. The recent suggestion, therefore, that the male reserve should be eight per cent. of the three-year-old bachelors is well on the side of conservatism. Such a solution of the question is very much more in line with the actual needs of the case than the prescription of a definite number of reserved males as is done by the present law. The system suggested has the advantage of applying successfully to a herd of any size be it one of thousands of individuals or millions.

The practical application of such a reserving system is relatively simple. The reserve first of all should be made in seals of one age, the most marketable so far as their skins are concerned, namely, the three-year-olds. In the drives it has been demonstrated that the native killers can pick out individuals of this age with almost perfect certainty. All that it is necessary to do in making this reserve is to mark eight per cent. of the three-year-old seals in a given drive by cropping the hair on one side of their heads with ordinary sheep shears and then ignoring such marked individuals in all future drives. Such seals are easily recognizable throughout the rest of the season and on their return the next year they have automatically passed on to the four-year class and are thus preserved as breeders.

The only objection to this system that has been raised is that it assumes that a better proportion of the sexes for breeding purposes can be worked out by man than has been established by nature. That such an improvement has already been successfully practised by man is well demonstrated in the common barnyard fowl. This bird both in its wild state and in its domestic condition produces about equal numbers of males and females, yet in its breeding habits one cock serves successfully a number of hens. It is as preposterous to claim that the

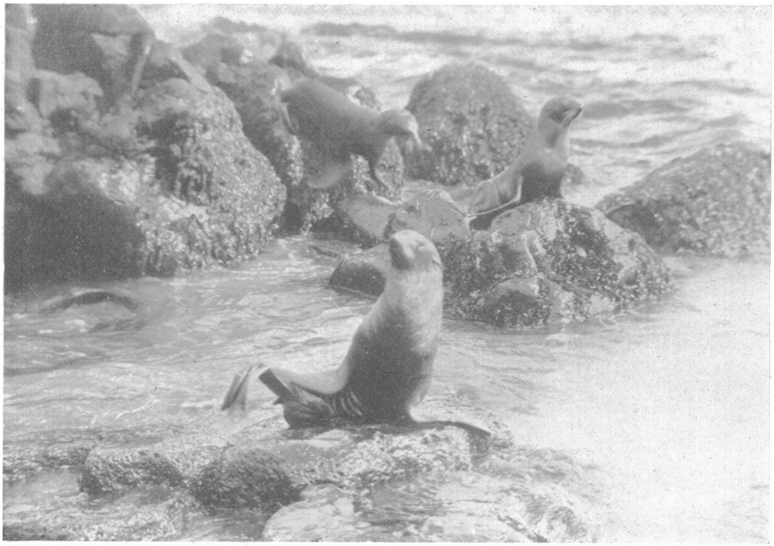


FIG. 22. ROVING BACHELORS. Kitovi Rookery, August 23, 1914.

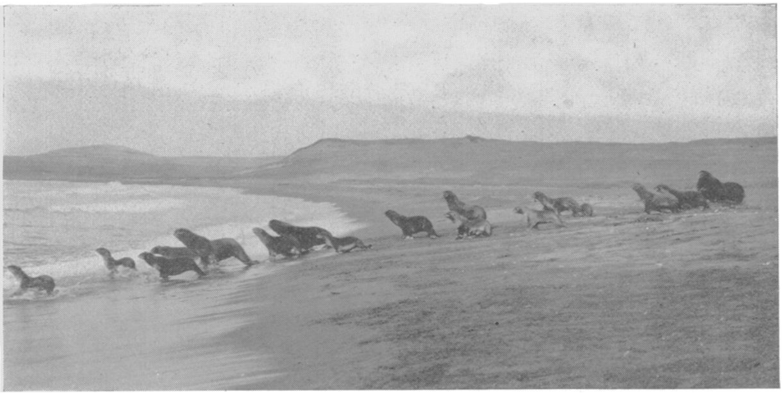


FIG. 23. STAMPEDE OF BACHELORS AT TOLSTOI BEACH, August, 1914.

natal proportions of the sexes of the fur-seals can not be readjusted advantageously by man as it would be to maintain that there must be one cock for each hen in the barnyard for the reason that nature has produced the two sexes in equal numbers. The elimination of a reasonable proportion of the male fur-seals from the herd can have no other effect than to reduce somewhat the daily conflicts between the members of this sex and is certainly a step in the direction of increased welfare for the herd as a whole.

From the standpoint of the government such a proportional killing of three-year-old seals is also advantageous, for it would increase considerably the present supply of marketable seal skins and not only not endanger the herd but, as already indicated, put it in a more favorable condition. The increase of revenue thus brought about is estimated in the hundreds of thousands of dollars annually, sums which under the

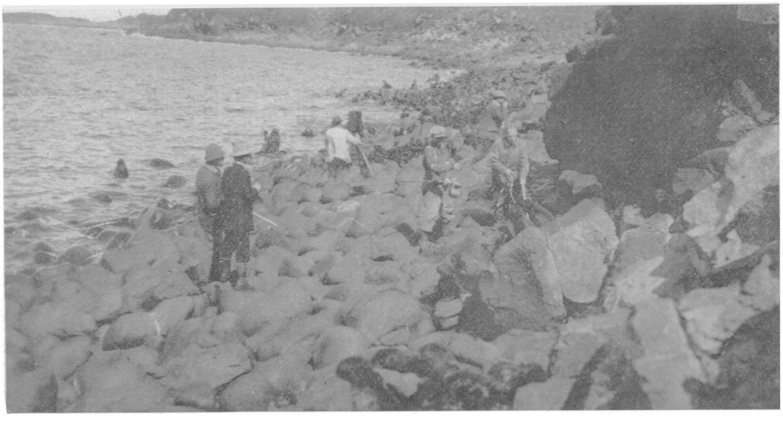
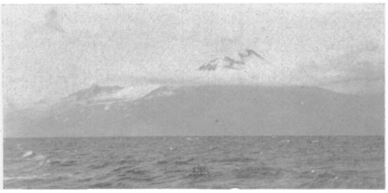


FIG. 24. COUNTING PUPS ON GORBATCH ROOKERY, July 30, 1914.

present law are slipping through the fingers of the government. Since the fur-seal herd of the Pribilofs contains at present probably not far from a third of a million of animals and is therefore nowhere near extinction, and since the breeding habits of these seals are such as to call forth a steady increase of useless males, it seems only reasonable that a law that gives these males undue protection should be revised, whereby a safe proportional killing of them should be permitted. In this way the herd could be rendered more stable and the government would receive a greatly increased income which at present is being dissipated in the open Pacific. In other words, the Pribilof fur-seal herd is not only in active process of restoration but a reasonable form of commercial killing should have been resumed several years ago.



SHISHALDIN AND ISANOTSKI VOLCANOES, NEAR UNIMAK PASS.